



Just the Facts... Dengue

- Dengue [DEN-ghee] is a flu-like viral disease spread by the bite of infected mosquitoes. Dengue hemorrhagic fever is a severe, often fatal complication of dengue.
- Dengue occurs in most tropical areas of the world. Most U.S. cases occur in travelers returning from abroad, but the dengue risk is increasing for persons living along the Texas-Mexican border and in other parts of the southern United States.
- There is no specific treatment for dengue.
- Prevention centers on avoiding mosquito bites in areas where dengue occurs or might occur and eliminating breeding sites.

What is dengue? What is dengue hemorrhagic fever?

Dengue is a flu-like illness spread by the bite of an infected mosquito. Dengue hemorrhagic fever (DHF) is a severe, often fatal, complication of dengue.

What is the infectious agent that causes dengue?

Dengue and dengue hemorrhagic fever are caused by any of the dengue family of viruses. Infection with one virus does not protect a person against infection with another.

How is dengue spread?

Dengue is spread by the bite of an *Aedes* mosquito. The mosquito transmits the disease by biting an infected person and then biting someone else.

Where is dengue found?

Dengue viruses occur in most tropical areas of the world. Dengue is common in Africa, Asia, the Pacific, Australia, and Central and South America. It is widespread in the Caribbean basin. Dengue is most common in cities but can also be found in rural areas. It is rarely found in mountainous areas above 4,000 feet.

The mosquitoes that transmit dengue live among humans and breed in discarded tires, flowerpots, old oil drums, and water storage containers close to human dwellings. Unlike the mosquitoes that cause malaria, dengue mosquitoes bite during the day.

What are the signs and symptoms of dengue and dengue hemorrhagic fever?

Dengue usually starts suddenly with a high fever, rash, severe headache, pain behind the eyes, and muscle and

joint pain. The severity of the joint pain has given dengue the name "breakbone fever." Nausea, vomiting, and loss of appetite are common. A rash usually appears 3 to 4 days after the start of the fever. The illness can last up to 10 days, but complete recovery can take as long as a month. Older children and adults are usually sicker than young children. Most dengue infections result in relatively mild illness, but some can progress to dengue hemorrhagic fever. In this form of the disease, the blood vessels start to leak, causing bleeding from the nose, mouth, and gums. Bruising can be a sign of bleeding inside the body. Without prompt treatment, the blood vessels can collapse, causing shock (dengue shock syndrome). Dengue hemorrhagic fever is fatal in about 5 percent of cases, mostly among children and young adults.

How soon after exposure do symptoms appear?

The time between the bite of a mosquito carrying dengue virus and the start of symptoms averages 4 to 6 days, with a range of 3 to 14 days. An infected person cannot spread the infection to other persons but can be a source, or reservoir, of dengue virus for mosquitoes for about 6 days.

How is dengue diagnosed?

Dengue is diagnosed by a blood test.

Who is at risk for dengue?

Anyone who is bitten by an infected mosquito can get dengue. Risk factors for dengue hemorrhagic fever include a person's age and immune status, as well as the type of infecting virus. Persons who were previously infected with one or more types of dengue virus are thought to be at greater risk for developing dengue hemorrhagic fever if infected again.

What is the treatment for dengue and dengue hemorrhagic fever?

There is no specific treatment for dengue. Persons with dengue should rest and drink plenty of fluids. They should be kept away from mosquitoes for the protection of others. Supportive care for dengue hemorrhagic fever includes replacing lost fluids. Some patients need transfusions to control bleeding.

How common is dengue?

In tropical countries around the world, dengue is one of the most common viral diseases spread to humans by mosquitoes. Tens of millions of cases of dengue fever and up to hundreds of thousands of cases of dengue hemorrhagic fever occur each year. In the United States, approximately 100 cases of dengue are reported each year in travelers returning from tropical areas.

Many more cases probably go unreported. A few persons have become infected with dengue while living in the United States. *Aedes* mosquitoes are found in Texas, Florida, and other southern states, and locally acquired dengue has been reported three times since 1980 in southern Texas.

Is dengue an emerging infectious disease?

Yes. All types of dengue virus are re-emerging worldwide and causing larger and more frequent epidemics, especially in cities in the tropics. The emergence of dengue as a major public health problem has been most dramatic in the western hemisphere. Dengue has reached epidemic levels in Central America and is threatening the United States. Several factors are contributing to the resurgence of dengue:

- No effective mosquito control efforts are underway in most countries with dengue.
- Public health systems to detect and control epidemics are deteriorating around the world.
- Rapid growth of cities in tropical countries has led to overcrowding, urban decay, and substandard sanitation, allowing more mosquitoes to live closer to more people.
- The increase in non-biodegradable plastic packaging and discarded tires is creating new breeding sites for mosquitoes.
- Increased jet air travel is helping people infected with dengue viruses to move easily from city to city.

Dengue hemorrhagic fever is also on the rise. Persons who have been infected with one or more forms of dengue virus are at greater risk for developing the more severe form of the disease. With the increase in all types of dengue viruses, the occurrence of dengue hemorrhagic fever becomes more likely.

How can dengue be prevented?

There is no vaccine to prevent dengue. Prevention centers on avoiding mosquito bites when traveling to areas where dengue occurs, or when in U.S. areas, especially along the Texas-Mexico border, where dengue might occur. Eliminating mosquito-breeding sites is another key prevention measure. Prevent mosquito bites:

- Use mosquito repellents on skin and clothing
- Use insect repellents that have been approved by the Environmental Protection Agency (EPA). They are safe and effective.
- For your skin, use a product that contains 20-50% **DEET** (N<N-diethyl-meta-toluamide). **DEET** in higher concentrations is no more effective. Do not use **DEET** on infants (children under 3 years old).
- Use **DEET** sparingly on children, and don't apply to their hands, which they often place in their mouths.
- Apply **DEET** lightly and evenly to exposed skin; do not use underneath clothing. Avoid contact with eyes, lips, and broken irritated skin.

- To apply to your face, first dispense a small amount of **DEET** onto your hands and then carefully spread a thin layer.
- Do not inhale aerosol formulations.
- Wash **DEET** off when exposure to mosquitoes ceases.
- For your clothing, use an insect repellent spray to help prevent bites through the fabric. Use a product that contains either **permethrin** or **DEET**. **Permethrin** is available commercially as 0.5% spray formulations.
- **Permethrin** should only be used on clothing; never on skin.
- When using any insect repellent, always FOLLOW LABEL DIRECTIONS.
- For optimum protection, soldiers should utilize the **DOD INSECT REPELLENT SYSTEM**. In addition to proper wear of the battle dress uniform (BDUs), which provides a physical barrier to insects, this system includes the concurrent use of both skin and clothing repellents:



Standard military skin repellent: 33% **DEET**, long-acting formulation, one application lasts up to 12 hours, **NSN 6840-01-284-3982**. Standard military clothing repellents, either: aerosol spray, 0.5% **permethrin**, one application lasts through 5-6 washes **NSN 6840-01-278-1336**; or impregnation kit, 40% **permethrin**, one application lasts the life of the uniform, **NSN 6840-01-345-0237**. Factory repellent-treated BDUs are also available through the military supply system.

Where can I get more information on Dengue and other forms of mosquito-borne viral encephalitis?

Contact the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Aberdeen Proving Ground, Maryland 21010-5403: DSN 584-3613; CM (410) 436-3613; FAX -2037; or visit our website at: <http://chppm-www.apgea.army.mil/ento>. Additional information can also be obtained from your local, county or state health departments, your health care provider or by contacting the CDC email: dvbid@cdc.gov, or visit their website: <http://www.cdc.gov/ncidod/dvbid/arbor/arboinfo.htm>.

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